RSC Advances

Supporting Information

Electrospun Composite Nanofibres of PVA Loaded with Nanoencapsulated n-Octadecane

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1. Recipe for preparation of PS/OD NCs by RAFT miniemulsion polymerization

Water	4.16 g
Styrene	1.04 g
SM-84	0.1508 g
OD	0.2658 g
NH_3 solution (0.5% w/v)	1.5 g
KPS	0.01 g (in 1ml DI water)
Temperature	68 °C

Figure S1 NC Latex.

2. Calculations for preparation of solution for making electrospun composite PVA nanofibres

Weight of OD in original latex = 0.2658 g

Total weight of latex obtained = 6.5688 g

Concentration of stock solution of PVA in water (dope) = 14% (w/w)

Weight of PVA dope taken for making spinning solution = 1.5 g

Weight of PVA in spinning solution = (1.5 ×14)/100 = 0.21 g

For making spinning solution with 20 wt% OD loading on the weight of PVA

Weight of OD needed in spinning solution = (0.21 × 20)/100

= 0.042 g

Since 0.2658 g of OD is present in 6.5688 g of latex (as mentioned above), therefore

For taking 0.042 g of OD, latex required = (6.5688 × 0.042)/0.2658 latex

= 1.038 g latex

Total weight of spinning solution = 1.5 g + 1.038 g

= 2.538 g

Net concentration of PVA in spinning solution = (0.21/2.538) ×100

= 8.3 wt%

3. Encapsulation Efficiency

3.1 Core content of Nanocapsules

Core content by weight = enthalpy of nanocapsules (J/g)/enthalpy of pure n-octadecane (215 J/g)

= 44/215

= 0.2046 (or 20.46% by weight)

3.2 OD content in composite nanofibres (15% OD loading)

Actual OD wt% in nanofibres = (enthalpy of loaded nanofibres/enthalpy of nanocapsules) × 100

= (4.3/44) × 100

= 9.7%

3.3 Efficiency of encapsulation for electrospun fibres with 15% OD loading

Efficiency of encapsulation = (actual OD content/added OD content) × 100

= (9.7/15) × 100

= 65%

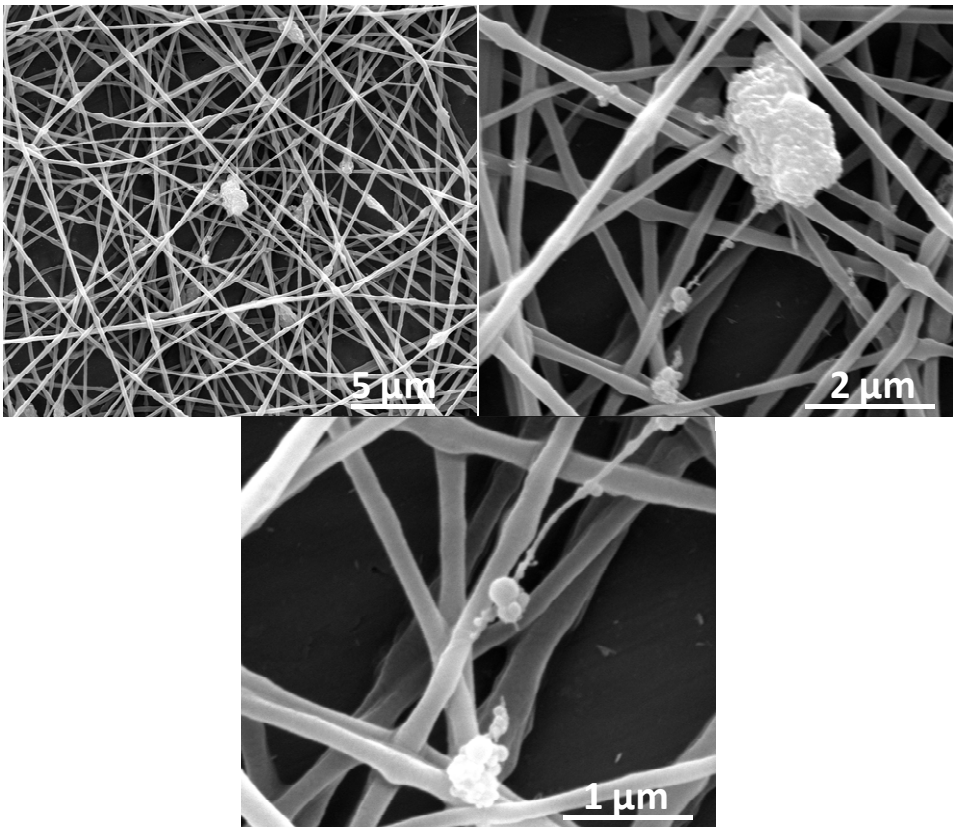

Figure S2. FE-SEM micrographs composite nanofibres with 20% OD loading at different magnifications.

For the sample with 20% OD loading, electrospinning was observed to be intermittent. Separate aggregates of NCs could also be seen in SEM micrographs. These were because of the decreased

concentration of PVA, which was unable to effectively encapsulate such high loading of octadecane.

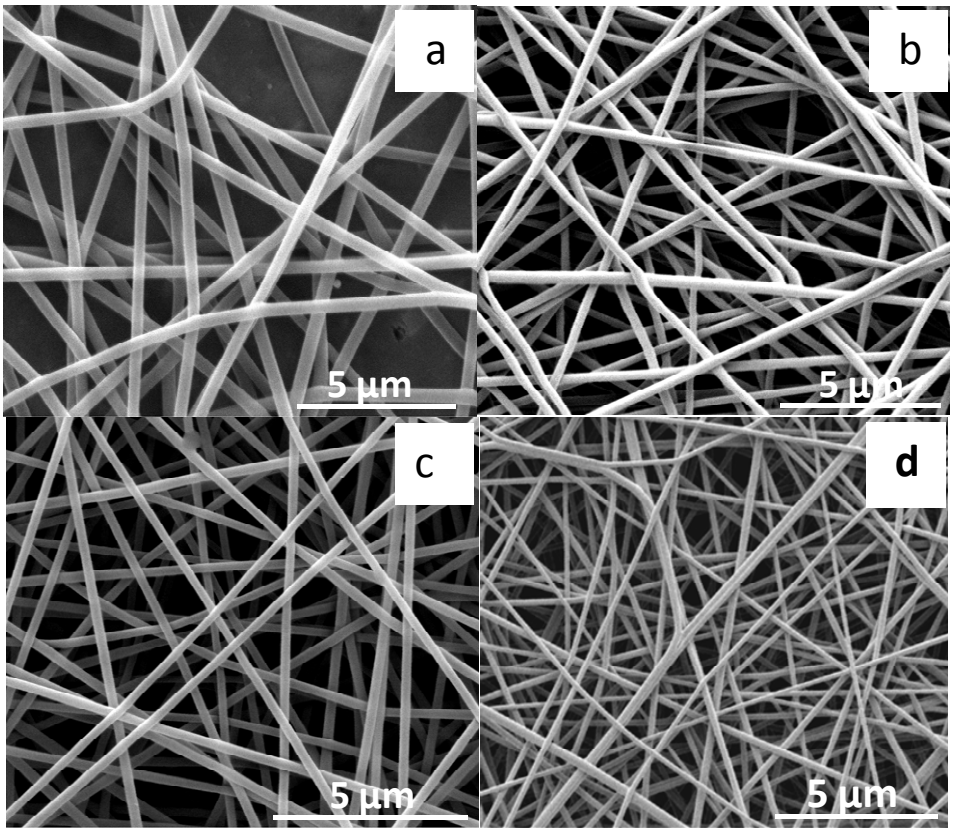

Figure S3. FE-SEM micrographs of control PVA nanofibres at (a) 14 wt%, (b) 10.4 wt%, (c) 9.2 wt% and d) 8.3 wt% concentration in water.